

What is claimed is:

1. An austenitic stainless steel characterized by consisting of, by mass %, C : more than 0.05 % to 0.15 %, Si : 2 % or less, Mn : 0.1 to 3 %, P : 0.04 % or less, S : 0.01 % or less, Cr : more than 20 % to less than 28 %, Ni : more than 15 % to 55 %, Cu : more than 2 % to 6 %, Nb : 0.1 to 0.8 %, V : 0.02 to 1.5 %, sol. Al : 0.001 to 0.1 %, N : more than 0.05 % to 0.3 % and O (Oxygen) : 0.006 % or less, and the balance Fe and impurities, further characterized by satisfying the following formulas (1) and (2):

$$P \leq 1/(11 \times Cu) \quad \dots(1)$$

$$\text{sol. Al} \leq 0.4 \times N \quad \dots(2)$$

wherein each element symbol in the formulas (1) and (2) represents the content (mass %) of each element.

2. An austenitic stainless steel characterized by consisting of, by mass %, C : more than 0.05 % to 0.15 %, Si : 2 % or less, Mn : 0.1 to 3 %, P : 0.04 % or less, S : 0.01 % or less, Cr : more than 20 % to less than 28 %, Ni : more than 15 % to 55 %, Cu : more than 2 % to 6 %, Nb : 0.1 to 0.8 %, V : 0.02 to 1.5 %, sol. Al : 0.001 to 0.1 %, N : more than 0.05 % to 0.3 % and O (Oxygen) : 0.006 % or less, and at least one element selected from the group consisting of Co : 0.05 to 5 %, Mo : 0.05 to 5 %, W : 0.05 to 10 %, Ti : 0.002 to 0.2 %, B : 0.0005 to 0.05 %, Zr : 0.0005 to 0.2 %, Hf : 0.0005 to 1 %, Ta : 0.01 to 8 %, Re : 0.01 to 8 %, Ir : 0.01 to 5 %, Pd : 0.01 to 5 %, Pt : 0.01 to 5 % and Ag : 0.01 to 5 %, and the balance Fe and impurities, further characterized by satisfying the following formulas (1) to (3).

$$P \leq 1/(11 \times Cu) \quad \dots(1)$$

$$\text{sol.Al} \leq 0.4 \times \text{N} \quad \dots(2)$$

$$\text{Mo} + (\text{W}/2) \leq 5 \quad \dots(3)$$

wherein each element symbol in the formulas (1) to (3) represents the content (mass %) of each element.

3. An austenitic stainless steel characterized by consisting of, by mass %, C : more than 0.05 % to 0.15 %, Si : 2 % or less, Mn : 0.1 to 3 %, P : 0.04 % or less, S : 0.01 % or less, Cr : more than 20 % to less than 28 %, Ni : more than 15 % to 55 %, Cu : more than 2 % to 6 %, Nb : 0.1 to 0.8 %, V : 0.02 to 1.5 %, sol. Al : 0.001 to 0.1 %, N : more than 0.05 % to 0.3 % and O (Oxygen) : 0.006 % or less, and at least one element selected from the group consisting of Mg : 0.0005 to 0.05 %, Ca : 0.0005 to 0.05 %, Y : 0.0005 to 0.5 %, La : 0.0005 to 0.5 %, Ce : 0.0005 to 0.5 %, Nd : 0.0005 to 0.5 % and Sc : 0.0005 to 0.5 %, and the balance Fe and impurities, further characterized by satisfying the following formulas (1) and (2).

$$\text{P} \leq 1/(11 \times \text{Cu}) \quad \dots(1)$$

$$\text{sol.Al} \leq 0.4 \times \text{N} \quad \dots(2)$$

wherein each element symbol in the formulas (1) and (2) represents the content (mass %) of each element.

4. An austenitic stainless steel characterized by consisting of, by mass %, C : more than 0.05 % to 0.15 %, Si : 2 % or less, Mn : 0.1 to 3 %, P : 0.04 % or less, S : 0.01 % or less, Cr : more than 20 % to less than 28 %, Ni : more than 15 % to 55 %, Cu : more than 2 % to 6 %, Nb : 0.1 to 0.8 %, V : 0.02 to 1.5 %, sol. Al : 0.001 to 0.1 %, N : more than 0.05 % to 0.3 % and O (Oxygen) : 0.006 % or less, and at least one element selected from the group consisting of Co : 0.05 to 5 %, Mo : 0.05

to 5 %, W : 0.05 to 10 %, Ti : 0.002 to 0.2 %, B : 0.0005 to 0.05 %, Zr : 0.0005 to 0.2 %, Hf : 0.0005 to 1 %, Ta : 0.01 to 8 %, Re : 0.01 to 8 %, Ir : 0.01 to 5 %, Pd : 0.01 to 5 %, Pt : 0.01 to 5 % and Ag : 0.01 to 5 %, and further at least one element selected from the group consisting of Mg : 0.0005 to 0.05 %, Ca : 0.0005 to 0.05 %, Y : 0.0005 to 0.5 %, La : 0.0005 to 0.5 %, Ce : 0.0005 to 0.5 %, Nd : 0.0005 to 0.5 % and Sc : 0.0005 to 0.5 %, and the balance Fe and impurities, further characterized by satisfying the following formulas (1) to (3).

$$P \leq 1 / (11 \times Cu) \quad \dots(1)$$

$$sol.Al \leq 0.4 \times N \quad \dots(2)$$

$$Mo + (W / 2) \leq 5 \quad \dots(3)$$

wherein each element symbol in the formulas (1) to (3) represents the content (mass %) of each element.

5. An austenitic stainless steel according to any of claims 1 to 4, further characterized by satisfying the following formula (4).

$$O \leq 1 / (60 \times Cu) \quad \dots(4)$$

wherein each element symbol in the formula (4) represents the content (mass %) of each element.